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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,879	03/16/2001	John N. Hait	2807.2.20	7463

35430 7590 12/18/2003

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EXAMINER	
CHAN, ALEX H	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/810,879	HAIT, JOHN N.	
	Examiner	Art Unit	
	Alex H Chan	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 18 of Fig. 1, 78 of Fig. 4, and 134 of Fig. 12. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 58c and 58 d (page 13, line 17), 42 of Fig. 5, (page 19, line 22), 64 of Fig. 3 (e.g. page 28, line 4), 16 of Fig. 3 (page 28, line 8), 58 of Fig. 3 (page 28, line 6), and 173 of Fig. 12 (page 39, line 16). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claim 1, 2, 4-10, 15 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,459,519 B1 to Sasai et al (hereinafter Sasai) in view of U.S. Patent No. 6,049,642 to Nakamura et al (hereinafter Nakamura).

Regarding claims 1 and 7-8, Sasai discloses an input path (e.g. (b-7) of Fig. 7) for receiving a modulated photonic signal (via 180 and 120 of Fig. 7) containing first information embodied therein, and having a center frequency (ν of (b-7) of Fig. 8) and first sideband frequencies (ν-f_0 and ν+ f_0 of (b-7) of Fig. 8) associated therewith: a photonic filter (710 of Fig. 7). He does not explicitly disclose a frequency-selective filter operably connected to the input path, configured to receive and photonically substantially suppress the first sideband frequencies from the modulated photonic signal, to provide an output comprising the center frequency embodying the first information therein; and a photonic control signal path operably connected to the frequency-selective filter and configured to provide a photonic control signal for selecting frequencies to be separated.

Nakamura discloses a frequency-selective filter (combination of 1, 2 and 4 of Fig. 4 or 1 and 6 of Fig. 8) operably connected to the input path (11 of Fig. 4), configured to receive (receive optical signal shown in Fig. 5C) and photonically substantially suppress the first sideband frequencies (e.g. suppressing both sidebands of ω1) from the modulated photonic signal, to provide an output (13 of Fig. 4) comprising the center frequency (Fig. 5E) embodying the first information (e.g. ω2) therein; and a photonic control signal path (11 of Fig. 4) operably connected to the frequency-selective filter (via Arm 1 and B of Fig. 4) and configured to provide a photonic control signal (e.g. controlling light ω0) for selecting frequencies (e.g. selecting ω2 to be separated from ω1) to be separated (e.g. via 5 of Fig. 4 and by changing the refractive index,

Col. 5, line 54-Col. 6, line 7 & Col. 9, lines 1-12). Accordingly, one of the ordinary skill in the art would have been motivated to employ the above means in order to increase the speeds of optical transmission systems and of optical information-processing system (Col. 1, lines 8-13). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical transmitter of Sasai by incorporating the above means as taught by Nakamura because this increases the speeds of optical transmission systems and of optical information-processing system.

Regarding claim 2, Sasai discloses a first output path (e.g. via 140-2 of Fig. 7) operably connected to a destination (102-2 of Fig. 7 and Col. 20, lines 26-32) for receiving the first information (e.g. d-7 of Fig. 7 and Fig. 8).

Regarding claim 4, Sasai in view of Nakamura discloses the photonic filter is configured to retain the first information in the center frequency (e.g. υ of d-7 of Fig. 7 and 8, Sasai or ω2 of Fig. 5E, nakamura) from the input path to the output (e.g. from path of (b-7) to (f-7) of Fig. 7, Sasai or from 11 to 1 to 13 of Fig. 4, Nakamura).

Regarding claim 5, Nakamura discloses the photonic control signal is at least partially correlated relative to a frequency to be separated (e.g. ω2, which is to be separated, is constructed via ω1 being shifted by control light ω0, Col. 6, lines 17-21).

Regarding claim 6, Nakamura discloses that the photonic control signal is a continuous wave signal (e.g. it is shown that the controlling light ω0, as illustrated in Fig. 5B and after absorption ω2 as shown in Fig. 5C, has constant amplitude and frequency and therefore a continuous wave). Also, it would have been a matter of design choice to employ a photonic control signal as a continuous wave signal. This support rational is based on a recognition that the claimed differences exist not as a result of an attempt by applicant to solve a problem but merely amounts to selection of expedient known to the artisan of ordinary skill as design choice.

Regarding claim 9, Sasai in view of Nakamura discloses a second output path (140-1 of Fig. 7, Sasai or 12 of Fig. 4 and 5D, Nakamura), and wherein suppressing further comprises direction energy (e.g. via amplitudes and frequencies or via field strength waveform, Col. 27, lines 30-65, Sasai or via optical intensity filtered by HPF or LPF, Fig. 20, Nakamura) from the first sideband frequencies to the second output path.

Regarding claim 10, Sasai in view of Nakamura discloses the frequency separated is at least one of the frequencies corresponding to the first sideband ((a-7)-(d-7) of Fig. 8, Sasai and Fig. 5A-E, Nakamura).

Regarding claim 15, the limitations introduced by claim 15 correspond to the limitations introduced by claim 1. The treatment of claim 1 above reads on the corresponding limitations of claim 15.

Regarding claim 21, Sasai discloses a photonic drop filter (combination of 130 and 310 of Fig. 6).

5. **Claims 3 and 16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasai in view of Nakamura as applied to claim 1 above, and further in view of U.S. Patent No. 66,400,489 B1 to Suzuki et al (hereinafter Suzuki).

Regarding claims 3 and 16, Sasai in view of Nakamura fails to teach a photonic filter further comprises a photonic transistor. Suzuki teaches a photonic filter (e.g. interference filter, Fig. 14) further comprises a photonic transistor (e.g. filter works in a manner similar to that of an optical transistor, Col. 19, lines 33-35). One of the ordinary skill in the art would have been motivated to employ a photonic transistor for providing an interference filter with a solid-state displacement thin film in which displacement of expansion or contraction can be caused by a

very simple method or construction (Col. 4, lines 3-6). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical transmitter of Sasai in view of Nakamura by incorporating a photonic transistor comprising a photonic transistor as suggested by Suzuki because this provides an interference filter with a solid-state displacement thin film in which displacement of expansion or contraction can be caused by a very simple method or construction.

Regarding claim 17, Nakamura discloses the photonic control signal is at least partially correlated relative to a frequency to be separated (e.g. ω2, which is to be separated, is constructed via ω1 being shifted by control light ω0, Col. 6, lines 17-21).

Regarding claim 18, Nakamura discloses that the photonic control signal is a continuous wave signal (e.g. it is shown that the controlling light ω0, as illustrated in Fig. 5B and after absorption ω2 as shown in Fig. 5C, has constant amplitude and frequency and therefore a continuous wave). Also, it would have been a matter of design choice to employ a photonic control signal as a continuous wave signal. This support rational is based on a recognition that the claimed differences exist not as a result of an attempt by applicant to solve a problem but merely amounts to selection of expedient known to the artisan of ordinary skill as design choice.

6. **Claims 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasai in view of Nakamura and Suzuki as applied to claim 16 above, and further in view of U.S. Patent No. 5,227,908 to Henmi.

Regarding claim 19, Sasai in view of Nakamura discloses a telecommunications path (140-2 and 140-1 of Fig. 7, Sasai) configured to deliver a filtered photonic signal (OS_2 and OS_1 of Fig. 7, Sasai), received from the frequency-selective filter (710 of Fig. 7, Sasai or 2 and 4 of Fig. 4, Nakamura), to a receiver (102-2 and 102-1 of Fig. 7, Sasai), but fails to disclose the receiver, including a nonlinear device, configured to create, from the center frequency embodied in the filtered photonic signal, reconstituted sidebands corresponding to the first sideband frequencies and for outputting the center frequency and reconstituted sidebands. Henmi discloses the receiver (combination of 151 and 152), including a nonlinear device (e.g. photodetector inside receiver), configured to create, from the center frequency (200 of Fig. 2) embodied in the filtered photonic signal (108 of Fig. 1), reconstituted sidebands (e.g. reconstituting 202 of Fig. 2) corresponding to the first sideband frequencies and for outputting the center frequency and reconstituted sidebands (e.g. the received waveform became one similar to the transmitting signal of 103 of Fig. 3, Col. 5, line 48-Col. 6, line 4). One of the ordinary skill in the art would have been motivated to employ the receiver including a nonlinear device for providing a receiver unit for receiving the single side-band signal and reproducing the transmitting signal waveform (Col. 3, line 67-Col. 4, line 1). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical transmitter of Sasai in view of Nakamura and Suzuki by incorporating the above receiver as disclosed by Henmi because this helps to reproduces the transmitting signal waveform at the output.

Regarding claim 20, Henmi discloses that the frequency-selective filter is further configured to selectively attenuate the sidebands (e.g. by 20dB, 202 of Fig. 2) with respect to the carrier frequency (200 of Fig. 2 and Col. 5, lines 14-22).

7. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasai in view of Nakamura as applied to claim 1 above, and further in view of U.S. Patent No. 5,227,908 to Henmi.

Regarding claim 11, Sasai in view of Nakamura discloses a telecommunications path (140-2 and 140-1 of Fig. 7, Sasai) configured to deliver a filtered photonic signal (OS_2 and OS_1 of Fig. 7, Sasai), received from the frequency-selective filter (710 of Fig. 7, Sasai or 2 and 4 of Fig. 4, Nakamura), to a receiver (102-2 and 102-1 of Fig. 7, Sasai), but fails to disclose the receiver, including a nonlinear device, configured to create, from the center frequency embodied in the filtered photonic signal, reconstituted sidebands corresponding to the first sideband frequencies and for outputting the center frequency and reconstituted sidebands. Henmi discloses the receiver (combination of 151 and 152), including a nonlinear device (e.g. photodetector inside receiver), configured to create, from the center frequency (200 of Fig. 2) embodied in the filtered photonic signal (108 of Fig. 1), reconstituted sidebands (e.g. reconstituting 202 of Fig. 2) corresponding to the first sideband frequencies and for outputting the center frequency and reconstituted sidebands (e.g. the received waveform became one similar to the transmitting signal of 103 of Fig. 3, Col. 5, line 48-Col. 6, line 4). One of the ordinary skill in the art would have been motivated to employ the receiver including a nonlinear device for providing a receiver

unit for receiving the single side-band signal and reproducing the transmitting signal waveform (Col. 3, line 67-Col. 4, line 1). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical transmitter of Sasai in view of Nakamura by incorporating the above receiver as disclosed by Henmi because this helps to reproduces the transmitting signal waveform at the output.

Regarding claims 12-13, Sasai discloses that the nonlinear device is selected from the group consisting of an opto-electronic device (150-2 and 150-1 of Fig. 7), and a nonlinear optical element (e.g. photodetector inside 150-2 and 150-1 of Fig. 7).

8. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasai in view of Nakamura and Henmi as applied to claim 11 above, and further in view of U.S. Patent No. 6,452,706 B1 to Iida et al (hereinafter Iida).

Regarding claim 14, Henmi discloses a substantially linear electronic device (152 of Fig. 1, Col. 5, lines 1-3) for providing a linear output (153 of Fig. 1), but fails to disclose a non-linear electronic element operably connected thereto and configured to receive the linear output and create the first sidebands therefrom. Iida discloses a non-linear electronic element (e.g. limiter amplifier 2018 of Fig. 16 and Col. 15, lines 42-46) operably connected thereto and configured to receive the linear output (output from 2017 of Fig. 16) and create the first sidebands therefrom (e.g. by demodulating into the original AM signal, Col. 13, lines 39-53). One of the ordinary skill

in the art would have been motivated to employ the nonlinear electronic element for demodulating a desired signal for providing an optical reception system capable of suppressing a distortion due to phase shift under transmission and recover the original signal (Col. 4, lines 39-42). Therefore, it would have been obvious to one of artisan from the same endeavor at the time the invention was made to modify the optical transmitter of Sasai in view of Nakamura and Henmi by incorporating a nonlinear electronic element as taught by Iida operably connected to receive the linear output because this provides optical reception system capable of suppressing a distortion due to phase shift under transmission and recover the original signal.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chikama is cited to demonstrate an optical filter being controlled by optical filter control circuit (Fig. 6). Tsushima et al (U.S. Patent No. 5,140,453) is cited to show optical receiver comprising linear and nonlinear components (Fig. 1 and 4). Watanabe is cited to show a polarization controlled for controlling transmission light source which is to be received by receiver for filtration and demodulation for retrieving or extracting intermediate frequency band including frequency component (Fig. 3 and 6). Fee is cited to illustrate a series of optical filters at a receiver for photo-detecting different wavelengths (frequencies) and a summing amp for retrieving a composite subcarrier (Fig. 6A). Tsushima et al (U.S. Patent No. 5,305,134) is cited to sow an optical filter and a receiver for recovering a composite signal (Fig. 5A, 1 and 7). Way et al is cited to show how a carrier signal is separated into two carriers with corresponding

sidebands (Fig. 5D). Weber et al is cited to show how one sideband is removed (or suppressed) (Fig. 6). Majima et al is cited to demonstrate an optical receiver having linear and nonlinear components (Fig. 20, 9 and 13). Huber is cited to show a laser for modulating signals which are to be filtered, combined and received for extracting a plurality of subcarriers in their corresponding octave (Fig. 1-4). Sargis et al is cited to show a CW laser and how a desired subcarrier is extracted via optical filter (Fig. 1 and 2). LaGasse is cited to show an optical transmitter for transmitting sidebands (Fig. 1 and 3). Taylor is cited to show an optical receiver having photo-detecting for optical-to-electrical conversion (Fig/. 2 and 3A-B). Liu is cited to show how different signals 9sidebands) get reconstituted and received (Fig. 2). Schmuck is cited to demonstrate how sidebands are created and separated according to a data signal (Fig. 1). O'Bryne is cited to show a FSK receiver decoding a block of frequencies for retrieving the lobes of the 4-level FSK signal (Fig. 3A-C).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan
Patent Examiner, Art Unit 2633
December 9th, 2003

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